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LogiCall V6.0

For the LarKen Disk Operating System

SPECTRUM EMULATOR ROM COMPATIBLE

OPERATING MANUAL

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Issue-0

LogiCall

Version V6.0
Executive Level Synonym Execution Program
and Integrated Software Package
for the LarKen Disk Operating System

Introduction to *LogiCall*

LogiCall is an Executive Level Synonym Execution Program and integrated software package that enhances the speed and operating ease of your LarKen System 3. ***LogiCall*** permits you to move from drive to drive, back and forth between Spectrum and TS2068 modes, move into and out of your word processor, database, spreadsheet, terminal program and other programs using just a few logical keystrokes. ***LogiCall*** displays pictures and word processor files on the screen without using a graphics or word processor program.

The MOVE, ERASE, POINT, CAT, FORMAT, VERIFY and RESET keys all work without the RAND USR 100:/PRINT #4: prefix required when using LKDOS alone making executive level file management easy. Also, redundant easy to remember single key commands further shorten the file management requests. A key has also been provided for the RENAME feature.

Some features of ***LogiCall*** are:
1.) Prompts for the drive you wish to use next. (TAPE drive? Sure!)
2.) Automatic display of the selected drives disk CATalog.
3.) Current drive POINTer added to the disk status list.
4.) Prompts for the program you wish to run next.
5.) Permits SCAN select of the next program to LOAD into the TS2068.
6.) Contains convenient HELP screens.
7.) Executive level calls no longer require RAND USR 100:/PRINT #4:.
8.) All of the DOS function keys work as labeled!
9.) Runs in both TS2068 and Spectrum modes.
10.) Switches between TS2068 and Spectrum modes from any drive!
11.) Easily creates both TS & ZX AUTOSTART programs on disk.
12.) Easy call to SAVE the LogiCall program to disk.
13.) Easy calls for the FORMAT and MOVE programs.
14.) Easy calls for terminal and word processor software.
15.) Easy ERASE routine.
16.) Easy RENAME routine.
17.) Easy call for CRC (disk integrity verification).
18.) Easy call to refresh CATalog on screen, handy if disk swap occurred.
19.) Easy call for re-BOOTing AUTOSTART.
20.) Easy call to return disk drive POINTer prompt.
21.) Lets you change drives at the 'Program?' prompt.
22.) Displays SCREEN$ saves and decoded RLE pictures on screen.
23.) Displays WP files to screen without using WP. (32 or 64 wide)
24.) Prints CATalog out on TS2040 or large printer for disk labeling.
25.) No RESET switch or power down needed to terminate programs!
26.) Written in BASIC to allow user customization.
27.) All of this on just one block, [one disk track].

LogiCall exits the machine when a new program is LOADed and returns when you're through with that program to maximize the available RAM space. Filenames on disk are parsed for extensions to permit easy calling of files into the TS2068. No longer will you have to power down the TS2068 between programs. You can change the logic if you wish because ***LogiCall*** is written in BASIC.

Using *LogiCall*

LogiCall allows one to perform all of the LKDOS executive level features using only one easy to remember logical key stroke followed by **<ENTER>**.

DRIVE? prompt ====[0 1 2 3 4 T]====
When ***LogiCall*** is loaded into the TS2068 and begins execution, a brief CATalog showing only the executable files on the disk in the current drive is displayed along with the current drive number. The **'DRIVE?'** prompt is positioned at the lower left of the screen. Enter **'T'** for tape, a valid number between **0** and **4**, or just <ENTER> if you wish to remain on the current drive. If you select a drive other than the current drive, ***LogiCall*** will display the CATalog of the disk in the newly selected drive.

Program? prompt
The 'DRIVE?' prompt is now replaced by the **'Program?'** prompt. You may now type in the program name just as it is displayed in the CATalog or use the **Scan LOAD** feature described below.

====[MOVE ERASE POINT CATalog FORMAT VERIFY RESET]====
You may perform executive level file manipulation tasks at this point rather than calling in a program to run. The Sinclair key words **MOVE, ERASE, POINT, CAT**alog, **FORMAT, VERIFY, RESET** followed by <ENTER> allow you to perform file management routines without typing in RAND USR 100:/PRINT #4:. Use them at the 'Program?' prompt if you wish or type in the easy call character for the desired command from the list below:

LogiCall Commands available at the 'Program?' prompt

AUTOSTART ====[A - D]====
Press **'A'**[UTOSTART] <ENTER> **'D'** to create a TS2068 AUTOSTART on the current disk. If the LarKen V2 Spectrum EPROM in the Dock Port is currently selected, a Spectrum AUTOSTART will be created. This AUTOSTART can switch ROMs when it is called from any drive.

CATalog ====[9]====
Press **'9'** <ENTER> to display a fresh CATalog on your screen, handy if you've just swapped disks in the current drive. This CATalog is the standard LKDOS CATalog except the current disk drive pointer number has been added.

====[N]====
If a long CATalog scrolls off the screen in the TS2068 mode, press **'N'** instead of **'Y'** at the 'scroll?' prompt to display the 'Program?' prompt and suppress viewing the lower portion of the CATalog. This facilitates the Scan LOAD option explained elsewhere. *Sorry, the Spectrum mode doesn't have this feature because Spectrum BASIC doesn't support the keyword ON ERRor.* Please also note that the CATalog length may be manipulated as described below.

BRIEF CAT/VERBOSE CAT ====[B & V]====
The default **Brief CAT**alog displays only BASIC programs that can LOAD and RUN. This keeps the screen listing as short as possible for the convenience of double-sided disk drive users. There is generally no need to view the machine code files used by the BASIC drivers. The names of NMI saved programs should therefore be renamed in the LKDOS BASIC filename format if they are not called by BASIC drivers. If you wish to see the entire CATalog, **'V'**[erbose] <ENTER> will display the complete CATalog while **'B'**[rief] <ENTER> will display only the brief CATalog.

Only the complete or **Verbose CAT**alog is possible in the SPECTRUM mode. If you are a SSDD disk user, you may wish to modify L.B1 to default to the verbose CATalog instead of the brief. Change the phrase in line 49 to read LET V$="": instead of LET V$=".B^"

Scan LOAD ====[J or <ENTER>]====

At the 'Program?' prompt pressing **<ENTER>** or **'J'** <ENTER> will put ***LogiCall*** into the 'Scan LOAD' mode. The space bar or any key in the lower rows will advance the highlight bar down the screen while the top row of keys will send the highlight bar back to the top. The keys 'A' and 'Q' will therefore work in the same manner as experienced in previous Sinclair programs.

====[L]====

Holding down the 'L'[oad] key may be the easiest way to advance the highlight bar down the screen because it lies next to the <ENTER> key. The arrow keys move the highlight bar about the CATalog with or without using the <SHIFT> key. During this operation, the screen is actually being read in valid locations one character at a time to find valid LKDOS file names and those file names are being printed behind the 'Program?' prompt for you.

Now press <ENTER> to LOAD in the selected program.

COPY ===[Z or C]====

Press **'Z'** <ENTER> to print a COPY of the CATalog display on your **TS2040** printer or **'C'** <ENTER> to print a COPY on your **Large Printer**. This print out can be placed in the sleeve with the disk as a printed record of the files on the disk.

ERASE ====[7 or E]====

Press **'7'** or **'E'** <ENTER> to display the 'ERASE""' prompt. Next, enter the file name with the extension of the file to be erased. Press <ENTER> again and the file will be removed from the CATalog.

FORMAT ====[0 or F]====

Press **'0'** or **'F'**[ormat] <ENTER> to call the FORMAT.B_ program from the current drive when you wish to format or copy a disk. This FORMAT program provides a '0' option in the menu which permits exiting to the same drive from which the FORMAT program was called. If FORMAT.B_ is not on the current disk, the drive POINTer will change to drive 0 and the CATalog of the disk in that drive will be displayed.

HELP ====[? or H]====

Press **'?'** or **'H'** <ENTER> at either prompt to display the HELP screens. The HELP screens display some (but not all) of the keys that perform executive level commands and call when followed by <ENTER>. Here among other things you will find that entering 'W' at the 'Program?' prompt will LOAD the word processor software while 'T' will LOAD the terminal software. Please be sure to study these HELP screens!

LogiCall Restart ====[L]====

Press **'L'**[.B1] <ENTER> to RUN ***LogiCall*** from the start of the program.

MOVE ====[6 or M]====

Press **'6'** or **'M'**[ove] <ENTER> to call the MOVE.BL program from the current drive when you wish to move one file at a time from one disk to another or rename a file on a disk. This Move program provides a '0' option in the menu which permits exiting to the same drive from which the MOVE program was called. If MOVE.BL is not on the current disk, the 'RENAME"",""' prompt will be displayed.

NEW ====[N]====

Press **'N'**[ew] <ENTER> to activate the AUTOSTART program on the currently selected drive. It is this operation which permits switching from the Timex system ROM in the TS2068 to the Spectrum system ROM installed on the LarKen DOS board in the dock port and vice versa.

POINT ====[**8 or D or G and T**]====
Press '**8**', '**G**'[oto] or '**D**'[rive] <ENTER> to display the DRIVE? prompt. Press '0', '1', '2', '3' or '4' <ENTER> and the system will point to that drive. ***LogiCall*** will next display the CATalog of the disk in that drive. If instead you press '**T**'[ape] <ENTER> the system will prompt you to turn on the tape drive. The drive POINTer will remain on the last selected disk drive.

====[**0 1 2 3 4**]====
LogiCall will accept requests to change the drive POINTer at the 'Program?' prompt. Press '**1**', '**2**', '**3**' or '**4**' <ENTER> at the 'Program?' prompt to POINT to that drive and display its CATalog. If you know that FORMAT.B_ is not on the current drive, then pressing '**0**' <ENTER> will POINT to Drive 0.

Program Start Address ====[**P**]====
Press '**P**'[rogram] <ENTER> to confirm the address of the Beginning of BASIC. This is used to indicate whether the system is in the Spectrum or TS2068 mode and to give an indication that streams have been opened. These numbers should be 23755 for Spectrum and 26710 for TS2068. These numbers will be increased in increments of 50 when streams have been opened. Some programs will not work once streams have been opened because they incorrectly call machine code at an absolute address rather than the code's relative address. Machine code in a first line REMark statement is an example of a relative address call while machine code in the printer buffer, LKDOS cartridge or above RAM TOP are examples of absolute address calls.

RENAME ====[**5**]====
Press '**5**' <ENTER> (sorry, this one isn't logical) to display the 'RENAME"",""' prompt. Enter the name and extension of the file to be renamed, <ENTER>, the new file name with its extension, <ENTER> and the file will be renamed. Pressing '**6**' when MOVE.BL isn't present on the selected disk will also display the 'RENAME"",""' prompt.

RESET ====[**CS-SS-HOLD-RESET**]====
The RESET keying sequence, cap-shift symbol-shift-hold '**L**' will display the '©' character behind the 'Program?' prompt, then <ENTER> will activate the AUTOSTART program on the currently selected drive. It is this operation which permits switching from the Timex system ROM in the TS2068 to the Spectrum system ROM installed on the LarKen DOS board in the dock port and vice versa.

SAVE ====[**S**]====
Press '**S**'[ave] <ENTER> to save the ***LogiCall*** Exec. L.B1 on the current disk.

Terminal ====[**T and Y**]====
Press '**T**'[erminal] <ENTER> to call the terminal software. The terminal software can be MTERM II, Loader V or MaxCom. Others can be added to the call list. If you have to momentarily leave MTERM II or LOADER V for some reason, press '**Y**' <ENTER> to RETURN to it.

VERIFY ====[**R**]====
Press '**R**' <ENTER> to VERIFY that the disk has no CRC errors.

Word Processor ====[**W**]====
Press '**W**'[ord Processor] <ENTER> to call in the word processor software. The word processor can be Tasword TWO, MSCRIPT or Spectral Writer. Others can be added to the call list.

Additional features ====[**.C$ .CT .Cm**]====
If you enter a file with an extension of '**.C$**' at the 'Program?' prompt, ***LogiCall*** will assume it to be a screen file and display it on the screen. If you enter a file name with an extension of '**.Cm**', (not '.CM') or '**.CT**' at the 'Program?' prompt, ***LogiCall*** will assume it to be a word processor file and will display it on the screen directly from disk. If taswi.Cs and taswi.Ct are on the current disk drive, the display will be 64 columns wide. Pressing '**N**' <ENTER> to cancel the Scroll? prompt will work here also as described in the topic CATalog above.

INSTALLING the *LogiCall* Executive Operating System

As with all software you obtain, make a back-up copy of the LogiCall disk and store the original safely away. Place the copy in drive 0. If you do not have a RAMDISK, you may want this disk to become your boot-up disk.

The default system colors of the ***LogiCall*** Exec. (**L.B1**), white INK against blue BORDER & PAPER, can be changed in line 15 of **L.B1** program if you desire another color combination. White against blue is easiest on the eyes.

The ***LogiCall*** disk comes with a programmed head step rate of 30 ms. This may cause the newer model disk drives head stepping mechanism to chatter. Run the program steprt.B1 included with the ***LogiCall*** Ensemble to modify the head step rate on your boot-up disk to match your particular disk drive. DO NOT modify the original as you may never be able to read it again if you don't get the step rate number correct for your system. Shorter head step rates will usually quiet the drive but if the head step rate is too short the disk can't be read!

The ***LogiCall*** Exec. (L.B1), and **AUTOSTART**, created by ***LogiCall***, should be on the RAM-DISK and every floppy disk you have. During installation, AUTOSTART can be modified to start programs other than **L.B1**. See the section MODIFYING AUTOSTART below.

LOAD the program **L.B1** into your TS2068, run it and enter the drive number you wish to store it on. Press '**S**'[ave] at the 'Program?' prompt followed by <ENTER>. The program **L.B1** will be SAVEd on the current disk. Now press '**A**'[UTOSTART] at the 'Program?' prompt followed by **<ENTER>**, then '**D**' and the program AUTOSTART will be stored on the disk. Do this to every disk you use with LarKen's LKDOS. If the disk is to be a Spectrum disk, be sure to be in the Spectrum mode before creating AUTOSTART on the disk. This can be accomplished by powering up the TS2068 with the '**K**' key held down or issuing the command OUT 244,3 in the immediate mode. To aid you in locating your programs, install DISKS.B1 on the RAM-DISK, or on the boot-up disk in DRIVE 0 if you don't have a RAM-DISK.

Modifying AUTOSTART **===[A - A - GOTO 460 - D]===**

To modify the AUTOSTART program to call something other than **L.B1** during boot-up, press '**A**' and <ENTER> at the PROGRAM? prompt and wait for the tune. Next press '**A**' instead of 'D'. This will break the AUTOSTART program. Modify line 420 with the name and extension of the file you want AUTOSTART to call, then type **GOTO 460** <ENTER> followed by '**D**' to save the modified AUTOSTART program. NMI-F.B1 should be called by AUTOSTART on the boot disk to allow breaking out of Spectrum programs without turning off the machine.

It is not necessary to use the LarKen System feature of calling LKDOS by opening stream 4. Opening stream 4 conflicts with other things like MAX-DOS and ZEBRA Talker. See the section titled **"Why avoid using PRINT #4: ?"** on page 9 of this manual. However, if you must use the 'PRINT #4:' feature, modify line 410 by editing REM out of that line. **DO NOT** modify line 410 in the L.B1 program!

Modifying Existing Programs

Many of the popular program drivers have been modified for ***LogiCall*** and are included in this ensemble. You will have to modify the other disk based programs in your collection to LOAD L.B1 upon program completion. Most programs are saved on lines above 9990 or should be, so add line 9998 CLEAR: RANDOMIZE USR 100: LOAD "L.B1" to the program. L.B1 will then be run after each successful save. Use line 9999 for tape back-up saves.

On programs that are menu driven, add an option '0.) EXIT' to the menu that directs the program to the new line 9998. On programs that end with a STOP statement you can either modify it to read 'STOP: GOTO 9998' so that entering CONTinue <ENTER> after the STOP occurs will load L.B1, or change the STOP statement to read GOTO 9998. Also, modify MSCRIPT to SAVE and LOAD its WP files with the extension .Cm rather than .CM as Larry Kenny's LKDOS uses .CM for NMI saves. Remember that ***LogiCall*** prints files with either the .Cm or the .CT extension to the screen for fast identification.

When finished with a program, you do one of four things:

1.) Quit from the program's modified menu.
2.) STOP the program and then CONTinue <ENTER>.
3.) STOP the program and enter 'GOTO 9998' <ENTER>.
4.) RUN the program's BASIC driver which will LOAD L.B1.

The disk CATalog will again appear on the screen with the word 'DRIVE?' at the bottom of the screen and you can go again as before. [**No need for a RESET switch!!**]

AUTOSTART Notes

In the January 1993 Update! Magazine page 20, Peter Hyman gave a good clue to writing a better AUTOSTART program for the LarKen disk system. Like Peter, I have seen AUTOSTARTs that use two disk tracks. They are usually made from another program on the disk, sometimes called Menu.B1. Menu.B1 is provided to allow changes to the AUTOSTART program and is, therefore, identical to it. Three tracks on the disk now contain the same program!

AUTOSTART programs instruct the TS2068 what to do when the computer is powered up with the ENTER key held down or when the RAND USR 100: NEW sequence is typed in on either the TS2068 or Spectrum systems. Here are a few simple rules about AUTOSTART that should be heeded:

RULE 1: AUTOSTART should do little more than turn on the desired system ROM, reset RAMTOP, call another program from the disk (LOAD the program and RUN it) and save itself to that disk.

RULE 2: AUTOSTART should be 5089 bytes long. Using the CHAMBERS UTILITIES disk, you will find that an AUTOSTART made in both the TS2068 mode and the SPECTRUM mode will always start at address 22490.

RULE 3: The CLEAR number to use for both TS2068 and SPECTRUM is **27577**. One need not execute the PRINT 65536-FREE mentioned in the UPDATE! article to find the lowest point to move RAMTOP, always use **CLEAR 27577** instead. The area saved will always be one track long, 5090-1 bytes in both TS2068 and SPECTRUM modes.

Since many menu programs are too long to fit on a single track as an AUTOSTART SAVE in the TS2068 mode (SPECTRUM gives us 2955 bytes more), I submit the following program fragment that can be included in any menu program to create AUTOSTART. Since this is the AUTOSTART program fragment included within the lines of the ***LogiCall*** program, it is numbered accordingly:

```
   2 GOTO CODE "1": REM[205][102][0][62][3][211][244][201]
  49 LET H=CODE "d": LET Z=PEEK (PI+PI)=CODE "1"
 110 GO TO VAL "460-(30*Z)"
 400 CLEAR VAL "65535"
 410 REM RANDOMIZE USR CODE "d": OPEN # VAL "4","dd"
 420 RANDOMIZE USR CODE "d": LOAD "L.B1"  (or any other program you desire.)
 430 DELETE RND,VAL "399"
 440 DELETE VAL "461",VAL "9999"
 450 DELETE VAL "421",VAL "459"
 460 CLEAR VAL "27577": LET B=VAL "FN B(23635)": POKE VAL "B+15",IN CODE
"POKE": RANDOMIZE USR VAL "B+11": GOTO VAL "400": DEF FN B(X)=VAL "PEEK
X+256*PEEK(X+1)"
```

In line 2, the numbers in brackets are the machine code numbers POKEd into the locations following the REM token. This is the code that switches system ROMs when AUTOSTART is called. (See page 4 of the LarKen Manual.)

In line 49, H is assigned the value 100 to save RAM space when a subsequent need for the value 100 is needed. The heavy use of VAL and CODE saves RAM space. LET Z=PEEK(PI+PI)=CODE "1" reduces down to LET Z=(PEEK 6=49) assigning Z the value 1 if the software finds itself running in the Timex mode and 0 if running in the SPECTRUM mode. EXPLANATION: If the TS2068 ROM is operating the system, byte 6 hold the value 49. The SPECTRUM ROM holds 203. Therefore, if the TS2068 ROM is operating, the Boolean operator (PEEK 6=49) will be true and Z will equal 1. If the SPECTRUM ROM is operating, the Boolean operator (PEEK 6=49) will be false and Z will equal 0.

Line 110 bypasses lines 430 to 450 in the SPECTRUM mode thus avoiding a crash since the SPECTRUM does not have a delete command.

Line 400 sets RAM TOP to the top of physical RAM since AUTOSTART set it to 27577 to save disk space. Choose any other number you like up to 65535.

Line 410 is included in case one MUST open stream/channel 4. Since opening stream/channel 4 conflicts with ZEBRA Talkers and eats up precious RAM space, it is REMarked out. Opening stream/channel 4 really has no added programming value. Just edit REM out if you need to open stream 4 to the disk drive channel.

Line 420 calls the start-up program. This can be changed to NMI-F.B1, DISKS.B1, Menu.B1 or any other program you desire to call.

Lines 430 to 450 delete all unneeded lines from the AUTOSTART program fragment thus keeping the required space to one track in the TS2068 mode. This is not required in the SPECTRUM mode because:

1) Not having a DELETE command in its vocabulary it can't delete lines! and
2) SPECTRUM gives us 2955 more bytes of program space on an AUTOSTART save.

Finally, line 460 sets RAM TOP to the value which will save 5089 bytes, the size of one LarKen track. B is assigned the current beginning of BASIC address, the system ROM status of port 244 is POKEd into location B+15, the AUTOSTART save routine is called, and 400 is given to the AUTOSTART header as the line to AUTO RUN once this program is loaded.

Changing The Logic

Please follow these rules before modifying the ***LogiCall*** Exec. (**L.B1**). Do not revise the original copy of the **L.B1** you received but rather modify only copies of it for your own use by using an overlay. Also, never give away your modified copy, only copies of the unmodified original along with a copy of this manual. It wouldn't hurt to be sure your nearest vender receives $15 to support his existence. Enough said!

Follow these simple rules if you desire to make modifications to the ***LogiCall*** Exec. (**L.B1**):

1.) Make an overlay which contains only the changes you wish to make like the example given below. An overlay is simply a program fragment that modifies existing program lines as does line 2 and adds program lines as does line 123 after a MERGE.

2.) Save your overlay for future modification under the name L.B9 using the command **RANDOMIZE USR 100: SAVE "L.B9"** in the immediate mode.

3.) Merge your changes into a copy of L.B1 and save it to disk. (At the 'Program?' prompt, type 'Q' and ENTER. Then type **RANDOMIZE USR 100: MERGE "L.B9": GOTO 9990**). Use this modified ***LogiCall*** Exec. (**L.B1**) on all your personal disks.

Here is an example of an overlay: User Phil Kwitkowski wants to call DISKS.B1 from the ***LogiCall*** Exec. using a two keystroke input 'DI' followed by ENTER. His overlay program, L.B9, looks like this:

```
  2 GOTO CODE "1": REM[205][102][0][62][3][211][244][201]LogiCall V6.0L3PK2 by
Bob Swoger
123 IF P$="DI" THEN RANDOMIZE USR H: LOAD "DISKS.B1": GOSUB PI
```

The only required change to line 2 is the addition of your personal version number extension which includes your initials and a number. Phil's version 1 must now modify the LogiCall version number from V6.0L3 to V6.0L3PK1

Line 123 calls DISKS.B1 and if it is not found on the disk, sends the program pointer to line 3 of the ***LogiCall*** Exec. to reset the 'FILE NOT FOUND' flag.

Tape to Disk Program Transfer

HEADER.BT by Nazir Pashtoon is provided with the ***LogiCall*** Ensemble disk to aid in transferring tape programs from tape to disk. Use this utility whenever possible instead of the LarKen NMI feature to move the program from tape to disk as it will assist you in moving the entire program properly. HEADER.BT provides the start address and length of machine code files on tape. Type LOAD""CODE: RAND USR 100: SAVE "fname.C1"CODE start,length to move MC to disk.

Sometimes programs refuse to be moved from tape to disk due to copy guard measures used by the original programmers. LarKen LKDOS gives us a way around this, however, some NMI users lose portions of the programs.

Timex/Sinclair programs usually come with instructions either printed as a small booklet slipped into the cassette holder with the tape or printed on the cassette holder's flap insert. The instruction set is the first important part of a program that must be provided for in a tape to disk transfer.

Second, the program usually comes with is a nice start up screen used to give us something to look at while the long program load continues. These screens are sometimes more impressive than the rest of the program! The original programmer often spent great effort on these screens for our pleasure and we like to see those screens!

Third, a BASIC driver may have controlled the loading sequence for all that was to happen before our very eyes. All this is often lost when an NMI save is used to transfer programs from tape to disk.

When putting programs on disk using NMI techniques, type or scan the instructions into a TASWORD file if those instructions are not too long. Otherwise spend the time to copy or scan those files into something that can be put into a binder.

Do your best to save the start up screen using either a straight tape to disk transfer (preferred) or by using the NMI screen save (press 'S' instead of a number to accomplish a screen save). The NMI screen save can then be loaded into Art Studio to clean up the register hash at the lower right side of the picture.

Spend some time doing an NMI save on the program so that program comes up at the very beginning when it LOADs in from disk.

Create a BASIC driver by either modifying the program's own BASIC driver or writing your own. This BASIC driver should first load in taswi.B_ available on the LogiCall disk followed by the start up screen. Next, it should load in the

Tasword instruction file if the user wishes to review the instructions. Finally, it should load in the NMI saved portion of the program.

Finally, put the BASIC driver, taswi.B__, Tasword instruction file, start up screen and NMI saved program on a freshly formatted disk. Copy this disk to another disk for regular use and file the original disk safely away. Using this technique you and other users get to enjoy the program the way it was first put out on tape with the exception of the long delay waiting for the tape to load.

Why avoid using PRINT #4: ?

Larry Kenny's purpose in opening up stream #4 to access LKDOS calls was because "PRINT #4: uses 3 less bytes than RAND USR 100: and looks neater" [page 11 of the LarKen V3 manual]. A slight improvement to Larry Kenny's RAND USR 100: can save even more RAM space.

To illustrate the RAM savings, let us consider a short program to load LogiCall. Sit down at your machine, turn on the TS2068 and type PRINT FREE <ENTER>. You get 38652. This is our free RAM space. Now enter the following two lines:

```
10 RANDOMIZE USE 100: OPEN #4, "dd"
20 PRINT #4: LOAD "L.B1"
```

Now type PRINT FREE <ENTER>. You get 38600. Strange, 29 key strokes used up 52 bytes! Now EDIT the lines using VAL with quotes around the 100 and the two 4s. The program now reads:

```
10 RANDOMIZE USE VAL "100": OPEN # VAL"4", "dd"
20 PRINT # VAL"4": LOAD "L.B1"
```

Now type PRINT FREE <ENTER>. You get 38609. Strange, you just added 9 keystrokes to the program and saved 9 bytes of RAM! Now for the ultimate RAM saving trick. Most numbers over 31 can be expressed in the program as CODE. Let's change VAL"100" to CODE "d", the two are equivalent. (See page 242 in the TS2068 manual or type 'PRINT CODE "d" and check the response.) The program now reads:

```
10 RANDOMIZE USE CODE "d": OPEN # VAL"4", "dd"
20 PRINT # VAL"4": LOAD "L.B1"
```

Now type PRINT FREE <ENTER>. You get 38611. Losing the two zeros bought us two more bytes. Notice that the following statements all mean the same thing.

```
RANDOMIZE USR 100
RANDOMIZE USR VAL "100"
RANDOMIZE USR CODE "d"
```

But what about opening stream #4 to save RAM space. Type in the program:

```
10 LET h=CODE "d"
20 RANDOMIZE USR h: LOAD "L.B1"
```

Now type PRINT FREE <ENTER>. You get 38624.

All four programs will LOAD LogiCall but the busiest RAM saving stream #4 call eats 41 bytes while the USR call uses only 28. And, for the record, RAND USR h is six bytes shorter than PRINT # 4 and just as easy to type, so, **WHY OPEN STREAM #4?**

So what does this all mean? Use **LET h=CODE "d"** instead of using RAND USE 100: OPEN #4, "dd" in the beginning of the program. Just be sure it follows rather than precedes any CLEAR statement. Then, use **RAND USR h**: instead of PRINT #4: before all disk commands.

LogiCall Operating System and the First Time User

Make a copy of the ***LogiCall*** disk and put the original away in a safe place. Change the AUTOSTART program to call NMI-F.B1 instead of L.B1 using the instructions in the MODIFY AUTOSTART section on page 5. Enter your own program names into the program DISKS.B1 as described in the separate section for the DISKS.B1 program. If you have a LarKen RAMDISK move L.B1, NMI-F.B1, DISKS.B1, FORMAT.B_, MOVE.BL and AUTOSTART to the RAMDISK.

Start with the TS2068 turned off. Hold down the ('**J**' key if you have the PAMDISK and) **<ENTER>** key while you power up the TS2068. Instantly the LarKen disk catalog comes up on the screen. Press **<ENTER>** twice and use the arrow keys to move the highlight bar over DISKS.B1 and press **<ENTER>**. DISKS.B1 allows you to locate a program on one of up to 400 disks. DISKS.B1 is covered in a separate section on page 17.

Peruse the menu boards using the '**N**'[ext] and '**B**'[ack] or number keys to find the needed disk(s) in your library cases. Place the disk(s) you have selected into the desired drive(s) and enter '**Q**'[uit]. The RAM-DISK CATalog or, if you don't have a RAM-DISK, the drive 0 CATalog is automatically displayed on the screen along with the drive number and at the bottom the '**DRIVE?**' prompt.

Enter the number of the drive you wish to use next. The CATalog of the disk in that drive is now displayed on the screen (along with the DRIVE # to remind you where you are at if you happen to look away for a moment) and at the bottom of the screen the '**Program?**' prompt.

Enter the name and extension of the file you wish to call followed by **<ENTER>**. If you don't care to type in the name and extension of the file, press **<ENTER>** at the '**Program?**' prompt and you will enter the '**Scan LOAD**' mode. Use the arrow keys to highlight the desired program and press **<ENTER>**. The program will load into the TS2068 and run.

When you are finished with the program, you return to ***LogiCall.***

The disk CATalog will appear on the screen again with the '**DRIVE?**' prompt at the bottom of the screen and you can go again as before. [No need for a RESET switch!!] Pressing **<ENTER>** without a number will allow you to stay on the present drive.

Any file management routine can be accomplished at the '**Program?**' prompt a. Pressing '**H**' **<ENTER>** will display the on screen **HELP** file showing at least one of the single key easy to remember ***LogiCall*** commands.

Some first time users like to take a guided tour the first time out. Below is such a tour. Try it once even if you've used ***LogiCall*** before.

The GUIDED Tour

Jay Shepard of Iowa called me one evening because he had a slight problem when he installed his LarKen DOS cartridge into his AERCO disk system. He had neglected to cut a wire mentioned in the instructions. But this gave me an opportunity to give him a guided tour of LogiCall. (He has since acquired a full blown LarKen System.)

"Put your COPY of LogiCall disk #1 into drive 0, hold down the ENTER key and turn on the power. What happened?" I asked. "Drive 0 turned on... and the LarKen CATalog is on my screen .. except it's also telling me what drive I'm looking at." was his reply. "That's the LogiCall screen and in the lower left of the screen?" "It's asking for a drive number." "OK, just press 0 or ENTER. You'll stay on drive 0." "Now it's asking for a program name." he said. "RIGHT! Now press your FORMAT key and ENTER." "The LarKen FORMAT menu is on the screen except... it has a 0 selection to EXIT." he replied. "Now press 0" "I'm back to LogiCall." said he. "Now just press ENTER at the Drive? prompt then press the MOVE key and ENTER at the PROGRAM? prompt." "My MOVE menu is on the screen and there is a 0 selection to EXIT." he replied. "Now press 0" "I'm back to LogiCall." said he. "I'll show you why. Press H and ENTER" "A HELP menu came up on my screen!" "Press ENTER again." "A second page!" "Yep, two pages of logical one key operations. Now press ENTER." "Back to LogiCall." he said. "At the PROGRAM? prompt press W and enter." "My TASWORD TWO word processor!" he was laughing at this point. "Now select either e or q on the TASWORD menu." "Its not on the menu." "Press one anyway." "OK, q then... well its on the menu now!" "Press ENTER twice."

"I'm back in LogiCall" "At the PROGRAM prompt press T for 'TERMINAL' and ENTER." "I'm in MTERM!" more laughter. "Now at the MTERM menu select E for exit to BASIC, then RUN and ENTER." "I'm back in LogiCall." he said. Check the speed of this next command. Press Y and ENTER." "I'm in MTERM again but it was like ... instantaneous!"

"Now at the PROGRAM? prompt press V and ENTER. You should see the VERBOSE or FULL CATalog." "Yes, all the machine code files are now listed with the BASIC programs." "I did this to avoid the scrolling users complained of when they used double sided drives. Don't do it now but B and ENTER will give you back a brief CATalog. OK, now at the PROGRAM? prompt type BROOKE.C$ and ENTER twice." "I'm looking at a picture of Brooke Shields!" this time giggling. "Press ENTER and at the PROGRAM? prompt type readme.CT" "That would be a TASWORD file wouldn't it? Hey! It's printing to the screen." "Yep, this lets you peruse word processor files quickly to determine which one you want to work on in your word processor. Now let's say we're too lazy to type in a program name. At the PROGRAM? prompt just press ENTER." "AUTOSTART just lit up." he said. "Now use the arrow keys to move down the CATalog to VUCALC.B1, then press ENTER." "OK, I'm looking at the VU-CALC start-up screen ... now I'm looking at the VU-CALC main screen with its menu at the top." "Good, now type #q and ENTER. You are now looking at a new menu I wrote that provides a new VU-CALC help menu and an exit to LogiCall option. Press 0 and your back to LogiCall."

"Now let's do a little file management. Press 5 and ENTER at the PROGRAM? prompt." "The bottom of the screen says RENAME "", what now?" he asked. "Type in L.B1 and press ENTER." "It now says RENAME "L.B1","" ... what next?" "Now type L.B2 and ENTER" "OK! A new CATalog just came on the screen with L.B2 listed instead of L.B1" "Now press your ERASE key and ENTER." "The bottom of the screen says ERASE "" ... what shall I erase?" "Erase L.B2." "OK" he said as he typed, "it no longer appears in the CATalog." "Now press S and ENTER." "I was just given a new CATalog with L.B1 back in the listing" he said. "That is because anytime you press S and ENTER LogiCall is saved to that disk. "If you happen to swap disks in that drive, pressing 9, your CAT key, and ENTER will give you the CATalog of that disk.

"Now consider the fact that you have powered up the TS2068 and have loaded SEVEN programs one after another, looked at two data files on the screen, renamed, deleted and created files all in less than three minutes, and have not yet turned off the computer to RESET it." I said. "NEAT! This is GREAT stuff!" he said, "But how do I make an AUTOSTART file to start up LogiCall on boot-up?" he asked. "Easy, at the PROGRAM? prompt press A, wait for the tune, then press D and the job is done." "Your kidding, what about disk space?" he asked. "AUTOSTART and LogiCall only use one track each. And of course they both work in the SPECTRUM mode."

"What is the DISKS.B1 file in the CATalog?" he asked. "Load it." I said. "It's there to assist you in locating all those programs you've collected through the years. I have over 400 disks to keep track of. You eyeball scan the menu boards using the 'N'[ext] and 'B'[ack] or number keys to find the needed disk(s) in your library cases, there is room for forty cases. DISKS.B1 is your Disk Filing System. E and ENTER saves your changes to DISKS.B1 and returns you to LogiCall. TAPES.B1 is the version for tape back-up storage."

If you have TROUBLE

The ***LogiCall*** version number in the first line of the program is followed by the LarKen LKDOS EPROM version number **L**[ogiCall]**.B1** has to work with. Each operating system, AERCO, LarKen, OLIGER and RAMEX, requires a different FORMAT program. Also, version 1 & 2 EPROMs are unable to do RENAME, and other features, requiring different versions of this software. V6.0L3 refers to LogiCall version 6.0 and LKDOS version L3. Versions A3, L3F, O3 and R3 can also be provided.

Your original LarKen System Disk contains the FORMAT program for your particular Disk Operating System configuration ending in .BF or .BL for LarKen, .BA for AERCO, .BO for OLIGER, .BR for RAMEX. The ***LogiCall*** version of the FORMAT program can be identified by the lower case letter at the end of the extension. ***LogiCall's*** FORMAT.B_ program calls in HcodeF.Cl or Hcode.Cl for LarKen, .Ca for AERCO, .Co for OLIGER, or .Cr for RAMEX, the same machine code that came with your LarKen system when you first purchased it.

If you are using something other than a complete LarKen system and you received this software from a friend rather than a vendor, you may have to create your own FORMAT.B_ program for your particular operating system by modifying the FORMAT.Bl program provided on this disk. ***LogiCall*** wants the extensions to be .Bf or .Bl for LarKen, .Ba for AERCO, .Bo for OLIGER, .Br for RAMEX. The FORMAT.B_ program you create should LOAD in and SAVE the appropriate Hcode_.C_ file for your system.

*(**Your software vendor now does this for you!**)*

When you have created your own FORMAT.B_ program, go into L.B1 and change the version number in the first line and the name of the FORMAT.B_ program in line 130 that you need to call in for your particular system, change the version number in line 2, then re-SAVE the program. This is now your new version for your own particular system.

The latest version of the ***LogiCall*** Executive program (L.B1) is always on the T/SNUG BBS. If you require help, you may phone me for instructions on how to download it.

If you have any questions about this software package contact:

--==GATOR SOFTWARE DEVELOPMENT==--

c/o Bob Swoger
613 Parkside Circle
Streamwood, IL 60107
H708-837-7957 W708-576-8068

Keep on Timexin'.......

NMI-F.BI v1.4

PART OF THE

LogiCall

Integrated Software Ensemble
for the LarKen Disk Operating System

NMI-F.B1 allows LKDOS users to exit gracefully from programs that have no other form of exit routine. This is most often the case with most Spectrum game programs. Without this program one would normally switch the TS2068 off to exit the program.

NMI-F.B1 was described to us in 1992 by George Chambers. This version runs faster. NMI-F.B1 loads machine code into the LKDOS cartridge. When the NMI button on the LarKen disk drive controller board is activated, the TS2068 stops doing what ever it is doing and runs the AUTOSTART program on the disk that is in the drive the NMI-F.B1 program was last run.

Once the program has run on the TS2068:

Press the NMI button on the LarKen disk drive controller board.

Press the 'F' key.

The TS2068 will run the AUTOSTART program on the disk that NMI-F.B1 was last executed from.

To 'HARD WIRE' the program to always run the AUTOSTART of a particular drive, edit out the REM from line 40. Next, edit the statement LET d = 128 to call the particular drive you want to boot:

DRIVE 0 = 2
DRIVE 1 = 4
DRIVE 2 = 8
DRIVE 3 = 16
DRIVE 4 = 128

Finally, type GOTO 9990 in the immediate mode to save the program and exit to ***LogiCall.***

If you have any questions about this software package contact:

--==GATOR SOFTWARE DEVELOPMENT==--

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Keep on Timexin.......

STEP RATE V2.1

HEAD STEPPING RATE CHANGER

PART OF THE

LogiCall

Integrated Software Ensemble
for the LarKen Disk Operating System

The May 1989 issue of Capital District T/S Computer Club's newsletter told of two members using TS2068s with LKDOS having trouble reading each other's disks. It seemed that Fred Lewis could read John Warrens disks but John could not read Fred's disks. This sounded familiar to me as I once had trouble reading disks that came from Rod Gowen and Larry Kenny.

The problem I had was head stepping rate. The drives I use have a 30 ms head stepping rate. This means that to move from track 0 (the directory track) to track 40 requires 1.2 seconds. A 6 ms stepping rate requires only 240 ms. What the controller chip does is wait a period of time to begin reading or writing the disk to give the head time to get to the desired track! The information for the stepping rate is placed in track 0 when the disk is FORMATed.

There is no problem reading the directory track because the head starts there, but the head on John's drive is not yet over the correct track when the controller tries to read the disk. For this reason John Warren could not read Fred Lewis's disks. Fred either has a newer controller chip or has drives with a 6 ms stepping rate and FORMATed his disks accordingly.

I could not read the SYSTEM disk that Larry Kenny sent me. Larry had not run into the slower drives up to that point. My drives are DEC dual drive units using TEAC drives purchased in the early 80's as a group buy and are so reliable I just won't give them up.

Larry was sure he had the answer when I phoned him and to get me started back in February of 1988, he sent a machine code program to the club BBS at 2 AM while I slept to fix his disks so that I might read them. I tried the code and it worked! I wrote a BASIC driver for the machine code and called the whole thing steprt.B1. The stepping rate information is in track 0 and his program fixes the disk to the required head stepping rates of 2, 3, 6, 12, 20 and 30 ms. The 2 and 3 ms rates are for 3.5" drives and require the WD1772 controller chip in the LarKen system along with the L3F DOS ROM and the FORMAT.Bf program to properly format disks for that system.

Now about controller chips, Larry started using the new Western Digital WD1772 chips that could only select 6 ms and faster head stepping mechanisms late in production. The WD1772 is best used for the 3.5" drives. I asked Larry, each time I ordered, to send me only the old WD1770 controller chip in units he built for me and CATUG members as over 200 of these TEAC units are in the area and we all want to be compatible.

When passing around disks for the LarKen disk operating system be sure they are formatted single side 40 track with a 30 ms head stepping rate so we all can read them.

To read unreadable disks, just load in the program **steprt.B1**, it will autorun. After removing the write protect label from the faulty disk, place it into DRIVE 0 and press <ENTER>. Follow the instructions and you will be able to read the disk from then on.

TASWORD TWO v2.84

PART OF THE

LogiCall

Integrated Software Ensemble for the LarKen Disk Operating System

This driver is a modification of the one that Larry Kenny sent out with his LKDOS for TS2068 package. It was modified per the needs of both LogiCall, Rod Gowen files and files made before LKDOS. After talking to owners of TASWORD TWO for LKDOS, the same complaints were heard over and over again, features had been removed to add the LKDOS features! There was no need for this, so they are all back and then some.

FEATURES

1.) Includes all the original TASWORD 2 commands.

2.) Includes all LKDOS modifications.

3.) Includes an EXIT back to LogiCall.

4.) Loads files using either 'j' or 'l' at the main menu.

5.) Uses .CT as a default extension and locates it for you if not in positions 7, 8 or 9.

6.) Lets you select your own extension.

7.) Entering no filename at the request for filename prompt in the SAVE routine will SAVE the file using the same filename used to LOAD the file.

8.) Entering nothing at the DRIVE? prompt lets you stay on the current drive.

To call in the TASWORD TWO word processor from LogiCall, press **'W' <ENTER>** at the PROGRAM? prompt. TASWORD TWO will LOAD into your TS2068 with the text area clear and in the menu mode. Press **'l'** or **'j'** to load in a file. TASWORD TWO will then ask you for the Drive number you wish to load from, show you a CATalog of the possible files to load, and then prompt you for the filename you wish to load. If the filename is X.CT or X .CT or even X   .CT, enter X and the file will LOAD into TASWORD TWO. If you enter the entire filename with the extension, any '.C_' extension, it also will load in.

Saving is easier also. If you are working on a file that you loaded in earlier and you wish to save it under the same file name, just hit ENTER at the filename prompt in the save routine!

Reloading is easier. If you are working on a file and you wish to reload it because you are not happy with the changes you have made so far, just hit ENTER at the filename prompt in the load routine!

Change the screen, ink and border colors for the word processor mode in LINE 9000 and re-save the program from the main menu.

To exit back to ***LogiCall***, go to the menu and select **'e'** or **'q'** [for 'exit' or 'quit'] and you will be back in ***LogiCall***. Be sure you have SAVEd your word processor file first or it will be lost!

Tape LOADs and SAVEs are also possible. Just press **'t'** at the DRIVE? prompt.

Keep on Timexin.......

VUFILE.B1 *V1.2*
&
VUCALC.B1 *V1.6*

PART OF THE

LogiCall

Integrated Software Ensemble
for the LarKen Disk Operating System

Basic Driver Features

These two BASIC drivers have been modified for ***LogiCall.*** Both permit LarKen LKDOS LOADs and SAVEs as well as exits to ***LogiCall.*** Data files are given automatic file extensions for both LOADs and SAVEs so that you need only enter a six or less letter file name.

VUFILE.B1 contains a the way back to ***LogiCall*** though the SAVE option. Use the SAVE path to find your way out.

VUCALC.B1 also contains a quickie HELP file so that infrequent use will not cause the user to have to hunt for the manual. To find this quickie HELP file, enter #Q as though you wished to quit. You will find a utility menu here that will save VU-CALC in two fashions and permits you to see the quickie HELP file. A return to VU-CALC is also provided along with an Exit to ***LogiCall.***

Two utilities are also provided to print out VU-CALC files to a large printer. These utilities prompt you for the name of the file to be printed as well as what columns and row you wish to print so that no further explanation is required here. Because **VC2TAS.B1** loads the VU-CALC file into TASWORD TWO, the file can be examined and modified before printing and is therefore generally favored over **VC2LP.B1.**

VC2LP.B1 permits **VU-CALC** spreadsheets to be printed to a large printer.

VC2TAS.B1 permits **VU-CALC** spreadsheets to be placed into a TASWORD 2 file.

If you have any questions about this software package contact:

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Keep on Timexin.......

DISK/TAPE DIRECTORY

PART OF THE

LogiCall

Integrated Software Ensemble
for the LarKen Disk Operating System

This program provides a way to find programs filed away on disks or tapes and manage their movement within or between storage cases with relative ease. Even without a disk drive system, this program is very useful for those still using a tape system on their machines or those who wish to file audio or video disks or cassettes. Because this program was first written as a tape CATalog, the documentation presented here is the cassette tape version with modifications given to change it to the LarKen disk CATalog version.

Each displayed board represents a storage box containing 20 slots. The 20 slots are divided into two columns of ten slots each. Please number these in your mind as 1 through 10 on the left side and 11 through 20 on the right. You may put titles as long as 12 characters into each space provided. You may then **A**dd new titles, Delete titles, or **M**ove a title from one slot to another slot either in the same box or a different box. The ability to see the titles in each box is as easy as hitting the '**N**ext' key and the '**B**ack' key, using the LEFT or RIGHT ARROW keys or just typing in the number of the box you wish to see. A **S**AVE feature with VERIFY is also provided. LPRINT key will print the contents of all 20 boxes to your TS2040 printer and the COPY key will send a picture of the box on the screen to the printer. This can be taped to the inside of the clear plastic top of the tape storage box to show what is inside.

Initialize The Database

Initializing the database will wipe out all previous records! Load DISKS.B1 or TAPES.B1 into the TS2068 and make ready your storage device. Typing in the following command in the immediate mode will initialize the database and save the program:

```
DIM G$(5201):GOTO 9990 <ENTER> for 20 Boards
DIM G$(10401):GOTO 9990 <ENTER> for 40 Boards
```

Never RUN this program as all the DATA will be erased! Use GOTO 1 instead.

HELP Screen

A **H**ELP screen is also available to show all the possible keys that will give you desired results. Just press '**H**' to see the **H**ELP file.

Filing Programs Away

I suggest that when storing tapes or disks that you try to keep a particular theme in each box, utilities in one box, games in another, word processors in another, terminal programs in another, etc. In this way locating a program is made easier. My recently acquired disk library-cases hold 10 disks each. I backup my LarKen RAM-DISK on disk 0 and then put disks 0 through 9 in the first case, 10 through 19 in the next case and so on. I then use slots 11 through 20 of the menu board to comment or expand the description for the first 10 slots.

Abbreviations

Now for a few words about abbreviating. As I stated earlier, there is room for only 12 character titles. To fit in longer titles, try leaving out first the vowels, then one of the consecutive double letters in a word. If the word starts with a vowel, leave it in. Most long titles will still make sense. You can use this trick for many other data records in filing systems. If someone misspells a word, it is often because they used the wrong vowel. The ancients could read and write without vowels and you will find that, knowing the rules, you can too. Also, it does save BITES!

Save, Exit or Quit

Thanks to the request of CATUG member Frank Mills, one can SAVE at any time by simply entering 'S', EXIT with a SAVE by entering 'E' or QUIT without a SAVE by entering 'Q'.

Disk Catalog Modification

To change the program for use as a LarKen disk CATalog change the following lines:

```
 610 REM *CUSTOM DISK CATALOG*
 9993 RANDOMIZE USR H: SAVE "DISKS.B1" LINE 8E3
 9995 REM POKE 23659,0: PRINT AT 22,0; PAPER 4;'" Now performing
CRC ":POKE 23659,2:PRINT AT 0,0
 9996 REM RANDOMIZE USR H: VERIFY ""
 9998 RANDOMIZE USR H: LOAD "L.B1"
```

Re-Sizing the Database

The number 5201 comes from the fact that there is room for 12 characters in a slot and one space for a total of 13, 20 slots per board, 20 boards and then 1 additional space. If one wanted 40 boards, then 13*20*40+1=10401. This would fit inside 4 disk tracks.

If you ever need to expand the file size, DIMension an H$ the same size as the G$ and using a FOR NEXT loop copy the contents of G$ into H$. DIMension G$ to the new size and using another FOR NEXT loop put the data back into the new G$, then DIMension H$ to 1. The routine at 9400 changed this program from 24 boards to 40 boards.

Full 24 Line Screen Display

Now for a few tricks. In her book "TS2068 BASICS and BEYOND", Sharon Zardetto Aker states that if we try to print to the 23rd and 24th line of the screen the system will crash. Don't you just love a challenge? Line 820 shows one of three ways to do this without crashing. The second is an input statement in the form of line 1020 and the third is with the use of the statement "PRINT # RND,"string".

Custom Keyboard Section

This is the entree point of the program. A REM statement in line 8020 DIMensions G$, the string which holds all the data. More on this in the initialize section. The CUSTOM KEYBOARD SECTION sets up custom features for your machine even after exiting the MENU program as long as the machine is not turned off or another program doesn't reset the feature. In this section you may enter your favorite POKEs to adjust key 'click' or 'repeat' key hold down duration.

My favorite feature of the CUSTOM KEYBOARD SECTION took me a little time to find but was well worth the effort. Since I have been writing BASIC programs for about 20 years now, I was accustomed to having my terminal come up in the CAP or upper case mode to answer prompts. This is accomplished in line 8040 with the POKE 23658,8 statement. POKEing this flag to 0 will cause the machine to return to the lower case mode. The GRAPHICS 'A' is set-up to provide the interesting background for the MENU board. This key is provided on the ZX81 but not the TS2068 and is a nice background on monochrome monitors. It will look purple on a color monitor although it is truly black and white dots! A 'c/o' key is provided on the GRAPHICS 'B' key.

Keep on Timexin.......